

Excalibur™ DAP 6456/SNMP

User's Guide

15D32A-7/A 7/97

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About This Manual

Manual Description

The *Excalibur DAP/6456 User's Guide* provides all the information you need to properly operate and troubleshoot this unit. It assumes you are familiar with basic data communications principles and terminology.

Refer to the *Excalibur DAP/6456 Quick Start Guide* for installation instructions.

This manual is composed of the following chapters:

- **Chapter 1, “Introduction”** contains an overview of the Excalibur DAP 6456/SNMP's capabilities and descriptions of all standard features.
- **Chapter 2, “Defining Operating Parameters”** explains how to configure the Excalibur DAP 6456/SNMP so that it will perform properly in your particular network environment. It also explains the functions of the unit's DIP switches.
- **Chapter 3, “Online Operation”** describes the different procedures that you can perform while the Excalibur DAP 6456/SNMP is operating online. These procedures include monitoring current operating status from five front panel LEDs and monitoring current line status, DTE status, test status, and line statistics from your terminal.
- **Chapter 4, “Troubleshooting”** describes each diagnostic test provided by the Excalibur DAP 6456/SNMP.
- **Appendix A, “Technical Specifications”**
- **Appendix B, “Regulatory Information”**
- **Appendix C, “Connector Pin and Signal Assignments”**

Conventions

The following typographical conventions are used in this manual:

- References to labeled parts of a device, such as LED indicators and connectors are shown in **boldface**. For example:

The **10BT** connector is located on the Excalibur DAP 6456/SNMP's rear panel.

- References to text that appears on your terminal screen are shown in **this font**. For example:

The terminal screen displays Password >.

- **Boldface text** denotes text you need to enter. For example:

Type **Service**.

- [ENTER] indicates that you must press a special keyboard key, such as Enter.



Caution: Cautions precede information that may result in equipment damage or major failure if the given procedures are not followed.

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Important Safety Instructions

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.
5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
6. Do not use the telephone to report a gas leak in the vicinity of the leak.



Caution: To ensure compliance with government regulations, do not install or operate this product until you have read the information contained in Appendix B.



Excalibur DAP 6456/SNMP

Chapter 1

Introduction

Product Overview

The Excalibur™ Digital Access Product (DAP) 6456/Simple Network Management Protocol (SNMP) provides a versatile, easy-to-use interface between your data terminal equipment (DTE) and digital data service networks. The unit is specifically designed to provide economical WAN access for routers. It supports synchronous data transmission over full-duplex channels at speeds of 56 and 64 Kbps.

The Excalibur DAP 6456/SNMP is designed to make operation and maintenance easy for even the most non-technical user. The unit can be easily configured and managed via a VT100-compliant terminal interface. Configuration parameters are minimal.

For even more comprehensive network control, the Excalibur DAP 6456/SNMP's integral SNMP agent provides a standards-based management interface. It allows you to manage your complete network via SNMP from either a Communications Management Series (CMS™) 400, CMS 6000, or generic SNMP manager.

For management, the Excalibur DAP 6456/SNMP provides a synchronous or asynchronous Point-to-Point Protocol (PPP)/asynchronous Serial Line Internet Protocol (SLIP) interface and an Ethernet (10Base-T) interface, which provides a direct connection to the LAN. With a direct connection, you save the expense of dedicating an expensive router port or providing an additional LAN server to route your SNMP traffic.

A CMS 400 system provides a custom management application for Windows. This SNMP-based application provides a sophisticated GUI (Graphical User Interface). The application makes Excalibur DAP 6456/SNMP configuration and operation quick and intuitive.

The Excalibur DAP 6456/SNMP provides full Telnet client support. This feature allows service personnel to access a specific Excalibur DAP 6456/SNMP for configuration or diagnostic purposes, using commonly available software running on a minimal platform.

Operating Environment

The Excalibur DAP 6456/SNMP operates on 56 Kbps Basic DDS in Switched Carrier mode. Constant Carrier mode is also supported on 56 Kbps Basic DDS or Clear Channel 64 Kbps service in point-to-point network configurations. Basic DDS supports point-to-point and multipoint network configurations. Clear Channel 64 Kbps supports point-to-point.

Access to management capabilities is provided via a Serial Interface/Configuration Terminal Interface (SI/CTI) port or via an Ethernet (10Base-T) port. The SI/CTI port is a synchronous/asynchronous interface that provides access for SNMP, Telnet, and terminal management. The SNMP or Telnet agent can be accessed via an external router port, the Auxiliary port on a Cisco router, a terminal server, a Racal CMS 8023, or a Racal CMS 8025. Figures 1-1 and Figure 1-2 show typical Excalibur DAP 6456/SNMP applications.

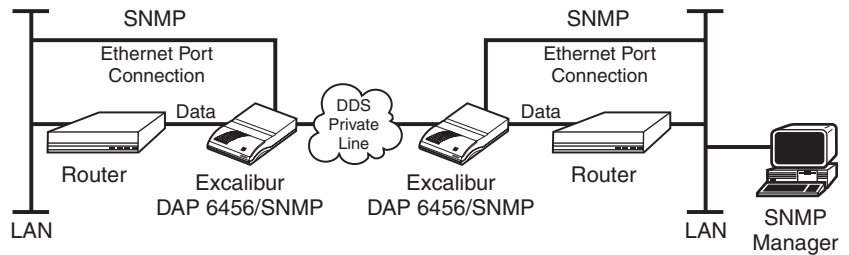


Figure 1-1. SNMP via a Direct Ethernet Connection

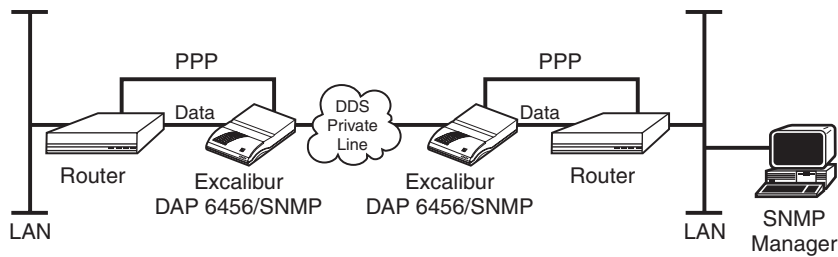


Figure 1-2. SNMP via a Router Port

Standard Features

The Excalibur DAP 6456/SNMP comes with a full complement of standard features, as described in the following sections.

Easy to Use

The Excalibur DAP 6456/SNMP can be easily configured and managed via a VT100-compliant terminal interface. Configuration parameters are minimal. The unit's service and line speed can be set automatically or manually via the terminal.

Choice of Digital Data Service

The Excalibur DAP 6456/SNMP offers the versatility to change between services as your needs and tariffs change. You can select 56 Kbps Basic DDS or Clear Channel 64 Kbps service.

Autobaud

The Autobaud feature allows the Excalibur DAP 6456/SNMP to automatically set the service and line speed upon unit reset or powerup. With automatic detection enabled, the unit automatically configures itself to match the type of service to which it is connected.

Diagnostics

Diagnostic tests allow you to quickly isolate the source of network malfunctions. The unit provides local digital loopback and remote V.54 digital loopback tests. The Excalibur DAP 6456/SNMP supports CSU loopback, latching loopback, and non-latching loopback tests initiated by the network. Additionally, the unit automatically runs an internal self-test each time it is powered up. This test verifies the functionality of the Excalibur DAP 6456/SNMP's internal circuitry. Any failures cause all the LEDs or the power LED to flash continuously.

Status Monitoring

Five LED indicators, located on the front of the unit, allow you to monitor the Excalibur DAP 6456's operating status at a glance. The LEDs inform you when power is applied to the unit, when a loopback test is active, and when a DDS line fault condition is present. Additionally, you can view current line status, DTE status, test status, and 24-hour line statistics from your terminal.

Configuration Upload and Download

The Excalibur DAP 6456/SNMP's download kernel allows you to quickly and easily upload and download the local unit's configuration from your terminal using Xmodem file transfer protocol over the CTI port.

You can upload and download the local and the remote Excalibur DAP 6456/SNMP's configuration via the PPP/SLIP port or via the Ethernet port, using TFTP (Trivial File Transfer Protocol). This protocol provides fast configuration uploading and downloading from a SNMP manager's TFTP server.

Software Download

The Excalibur DAP 6456/SNMP's download kernel allows you to quickly and easily download the local unit's software from your terminal using Xmodem file transfer protocol over the CTI port.

You can download the local and the remote Excalibur DAP 6456/SNMP's software via the PPP/SLIP port or via the Ethernet port, using TFTP. This protocol provides fast software downloading from a SNMP manager's TFTP server.

During downloading, the application software is protected so that the Excalibur DAP 6456/SNMP continues to operate in the event of a download failure. The unit keeps a permanent copy of the original software at all times. If the new download copy becomes corrupted, the original copy is used. This feature allows you to start another download if the previous transfer was not completed.

LAN Ethernet Interface

The Ethernet 10Base-T interface provides direct connection to the LAN for SNMP management purposes. With a direct connection, you save the expense of dedicating an expensive router port or providing an additional LAN server to route your SNMP traffic. The interface supports IEEE 802.3 and Ethernet Standards for Media Access Control formats and supports TCP/IP protocols.

Notes: Access from Token Ring networks is not directly supported. However, the serial interface can be connected to a Racal CMS 8025 to provide Token Ring access.

The Ethernet and Token Ring connections are used exclusively for Telnet or SNMP network management access. They cannot be used for the transfer of customer data.

A green and a yellow LED indicator are located on the Ethernet interface. The green indicator allows you to monitor the Ethernet link's operating status at a glance. Additionally, the yellow indicator is On for short period each time the Ethernet controller transmits a packet.

Integral SNMP Agent

For those networks that require comprehensive management, testing, and control features, the Excalibur DAP 6456/SNMP's integral SNMP agent provides a standards-based management interface. It allows you to manage your complete network via SNMP from a CMS 400, CMS 6000, or generic SNMP manager.

To simplify network management, Racal offers Excalibur DAP 6456/SNMP management for Windows. This SNMP-based application provides an intuitive graphical interface tailored specifically for Excalibur DAP products. You can use this application to fully configure the Excalibur DAP 6456/SNMP, monitor its performance, and display statistics, without having to send individual Set and Get commands. This application runs under Racal's CMS 400 management platform.

For your convenience, the Excalibur DAP 6456/SNMP MIB is published on the Internet. You can download the snmp6456.ASN file from either the Racal WWW site located at <http://www.racal.com.rdg.customer/support/mibs/mibarch.htm> or the ftp located at <ftp://ftp.cacal.com/pub/mibs/snmp6456.asn>.

Telnet Client Support

The Excalibur DAP 6456/SNMP provides Telnet client support. Network management via Telnet can be performed from any workstation in the network that has TCP/IP and a Telnet application. This feature allows service personnel to access a specific Excalibur DAP 6456/SNMP for configuration or diagnostic purposes, using commonly available software running on a minimal platform.

For security purposes, access from Telnet is protected by a user-configurable log-on sequence consisting of a user identifier and a password. A Telnet session is established only if the log-on entries match the user identifier and password stored in the non-volatile database of the Excalibur DAP 6456/SNMP. The Excalibur DAP 6456/SNMP supports only one user identifier and one password. Once the Telnet session is established, the user may log off at any time. The Excalibur DAP 6456/SNMP allows only one Telnet session at a time. The Excalibur DAP 6456/SNMP responds with a Busy message to additional Telnet session requests.

By entering commands from your terminal, you can enter the user identifier and password required for access from Telnet, and you can enable or disable the Login Trap feature. You can also specify the amount of time that the TCP handler will wait for a response to data it has sent before initiating a retry. Additionally, from your terminal, you can enable or disable the unit from allowing a Telnet session to be established, and you can view whether a Telnet session is active. You can also terminate an active session.

Note: The Serial Interface Configuration parameters (physical interface driver, PPP mode, PPP baud, and SLIP baud), IP address and Gateway address should not be changed using Telnet. Changing these parameters can result in losing Telnet access to the Excalibur DAP 6456/SNMP.

Chapter 2

Defining Operating Parameters

Overview

This chapter explains the functions of the Excalibur DAP 6456/SNMP's DIP switches and explains how to configure the unit's operating parameters to suit your particular network requirements. It contains a description of each parameter to help you decide which setting is correct for your application.

Setting the DIP Switches

Two DIP switches, labeled **LP** and **SI/CTI**, are located on the DAP 6456/SNMP's rear panel. (See Figure 2-1.) Table 2-1 lists each switch setting and its respective function.

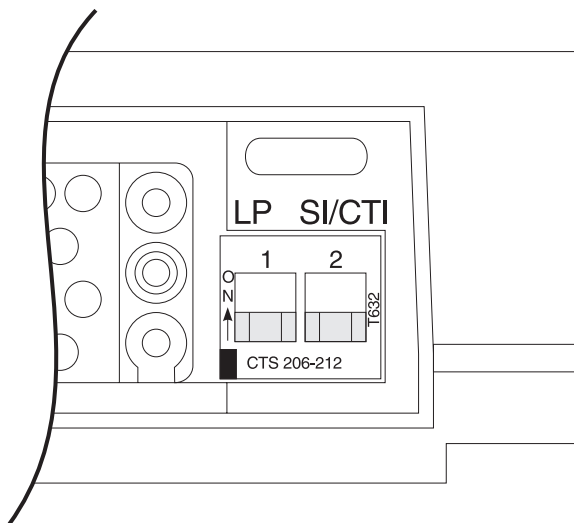


Figure 2-1. DIP Switch Settings

Table 2-1. DIP Switch Settings

Switch	Setting	Function Selected
LP (Loop Test)	Up	Initiates a local Digital Loop test.
	Down	Terminates a local Digital Loop test. (The “Digital Loop Test” section in Chapter 4 provides a complete description of this test.)
SI/CTI (Serial Interface/ Configuration Terminal Interface)	Up	Must be in this position when access to management capabilities is provided via a serial interface connection (PPP/SLIP).
	Down	Must be in this position when access to management capabilities is provided via a terminal connection and/or via an Ethernet connection.

Configuring the VT100-Compatible Terminal

Refer to your terminal user's manual to configure the applicable terminal parameters, as listed in Table 2-2.

Table 2-2. Terminal Parameters

Symbol	Function
Data Bits	8
Parity	None
Speed	19,200 bps

Logging In

Set the DIP switch, labeled **SI/CTI** on the rear panel, in the Down position. At start-up, the Configuration Terminal Interface (CTI) process is idle and you can attempt to access it from the terminal. If no CTI prompt is present, press [ENTER]. The default password is **SERVICE**, which can be changed at any time after initial login. The “Changing the Console Password” section in this chapter provides instructions.

Note: The unit takes approximately 20 seconds to power-up.

The screen displays Password >.

Type **SERVICE** [ENTER].

The screen displays the Main menu.

To end the session at any time, from the Main menu, type **6** [ENTER] at the -> prompt. If the terminal is idle for more than five minutes, a timeout feature disconnects the program and logs off the user.

Display Screens

The Excalibur DAP 6456/SNMP provides display screens with readily identifiable selections and prompts. All user inputs and prompts appear on the bottom of the screen. To select an option, type the number of the option, then press [ENTER]. Each time you select an option, a new submenu appears until the lowest level menu is reached, and the command is executed. To return from any menu to the previous menu, press the [ESC] key.

Restoring Defaults

If, at any time, you want to reset the unit to restore the factory defaults and start the configuration process over, from the Main menu, type **2** [ENTER]. Then type **7** [ENTER]. The screen displays the message: Restoring defaults will reset unit! Continue? (Yes [Y]/No [N]). Type **Y** [ENTER]. This restores the original factory settings, and allows you to reconfigure the unit.

Configuration Menu

The Excalibur DAP 6456/SNMP provides a tree structure of menus. The default setting for each parameter in the System Configuration submenu is shown in Figure 2-2.

Configuration Terminal Interface

System Configuration

1. DDS Line Configuration

- 1. Auto Baud (Enable[E]/Disable[D]) -> ENABLE*
- 2. DDS Line Rate (56K[1]/64K [2]) -> 56K*
- 3. External Clock (Enable[E]/Disable[D]) -> DISABLE*

2. Serial Interface Configuration

- 1. Physical Interface driver (PPP[1]/SLIP[2]) -> PPP*
- 2. PPP configuration*
 - 1. Mode (Async[1]/Sync[2]) -> Async*
 - 2. PPP baud (2400[1]/4800[2]/9600[3]/19200[4]) -> 19200*
- 3. SLIP configuration*
 - 1. SLIP baud (2400[1]/4800[2]/9600[3]/19200[4]) -> 19200*

3. Ethernet Configuration

- 1. Default Ethernet protocol(ETHERNET[1]/IEEE[2]) -> ETHERNET*
- 2. Ethernet Link Status (Enable[E]/Disable[D]) -> ENABLE*

4. IP Configuration

- 1. IP address -> 130.45.13.2*
- 2. Subnet mask -> 255.255.0.0*
- 3. Gateway IP address -> 0.0.0.0*

Figure 2-2. Configuration Menu Structure

5. Telnet Configuration

1. Telnet Session (Enable[E]/Disable[D]) -> *ENABLE*
2. User Name -> *RACAL-DATACOM*
3. Password -> *SERVICE*
4. Login Trap (Enable[E]/Disable[D]) -> *ENABLE*
5. TCP retry timeout (seconds) -> *15*

6. SNMP configuration

1. Primary Manager Configuration

1. Manager IP Address -> *0.0.0.0*
2. Get Community -> *public*
3. Set Community -> *public*
4. Trap Community -> *public*
5. Traps (Enable[E]/Disable[D]) -> *DISABLE*
6. TFTP Capability (Enable[E]/Disable[D]) -> *ENABLE*

2. Secondary Manager Configuration

1. Manager IP Address -> *0.0.0.0*
2. Get Community -> *public*
3. Set Community -> *public*
4. Trap Community -> *public*
5. Traps (Enable[E]/Disable[D]) -> *DISABLE*

7. Restore Factory Defaults

8. Reset Unit

Figure 2-2. Configuration Menu Structure (Continued)

DDS Line Configuration Parameters

The Line Configuration submenu allows you to specify the line rate and the source of timing signals for the Excalibur DAP 6456/SNMP's transmit clock. The following sections describe the function of each parameter.

Autobaud

When the Autobaud parameter is enabled, the Excalibur DAP 6456/SNMP automatically sets the service and line rate upon unit reset or powerup. With automatic detection enabled, the unit automatically configures itself to match the type of service to which it is connected. If the unit is powered up with no line connected, the Autobaud parameter defaults to 56 Kbps.

DDS Line Rate

The DDS Line Rate parameter specifies the line rate. Two options are available:

- 56 Kbps (Basic DDS service)
- 64 Kbps (Clear Channel 64 Kbps service)

This parameter setting must correspond with your dedicated line connection, unless the Autobaud parameter is enabled. The Excalibur DAP 6456/SNMP operates on either service with a -45 dB minimum receive level. The unit automatically compensates for fluctuations in the receive level from the DDS network. The transmit level is not adjustable.

External Clock

The External Clock parameter specifies the source of timing signals for the Excalibur DAP 6456/SNMP's transmit clock. This clock determines the rate at which data is transferred across the telephone line. When this parameter is disabled, the clock is provided by the DDS network via the receive line. When it is enabled, the unit accepts an external clock from the DTE and uses that signal to clock the transmit data coming from the DTE.

Notes: The External Clock option is available only when the line rate is 56 Kbps.

The clock source must be frequency locked to the network clock.

Serial Interface Configuration Parameters

The Serial Interface Configuration submenu allows you to select the physical interface driver (PPP or SLIP) and the line rate for the SNMP management port. For PPP, it also allows you to select the mode (SLIP is asynchronous mode only.) The following sections describe the function of each parameter.

Physical Interface Driver

The Physical Interface Driver parameter setting must correspond with the type of device connected to the Excalibur DAP 6456/SNMP. The available options are PPP and SLIP.

PPP Mode

The PPP Mode parameter setting must correspond with the type of device connected to the Excalibur DAP 6456/SNMP. The available options are Async and Sync.

PPP Baud

The PPP Baud parameter specifies the PPP channel rate. The available options are 2400, 4800, 9600, and 19200 bps. The default setting is 19,200 bps.

SLIP Baud

The SLIP Baud parameter specifies the SLIP channel rate. The available options are 2400, 4800, 9600, and 19200 bps. The default setting is 19,200 bps.

Ethernet Configuration Parameters

The Ethernet Configuration submenu contains the parameters that control basic Ethernet controller operation. The following sections describe the function of each parameter.

Default Ethernet Protocol

This Default Ethernet Protocol parameter specifies the default Ethernet protocol for packets originating from the Excalibur DAP 6456/SNMP and destined for a manager whose Ethernet protocol is unknown. The available options are IEEE (IEEE 802.3) and Ethernet (Ethernet Standards for Media Access Control). The DAP automatically honors both protocols when it determines which protocol is used by the manager.

Ethernet Link Status

The Ethernet controller continuously performs a Link Test. The green LED indicator, located on the rear panel's **10BT** connector, displays the results of this test. The indicator is On when the current test indicates the link is operational or when the Link Test is disabled. It is Off when the current test indicates the link is failing. This parameter should always be enabled.

IP Configuration Parameters

For the SNMP management feature to operate with Ethernet, the local Excalibur DAP 6456/SNMP must be assigned an IP address, a Gateway IP address, and a Subnet Mask. To operate with SLIP, the unit must be assigned an IP address. To operate with PPP, the unit must be assigned an IP address, which can be obtained from your network administrator. You do not need to enter this address. The Excalibur DAP 6456/SNMP automatically sets it in dotted decimal notation to the value that is requested by the PPP host. Even though you can change this address, it will be overridden by the PPP host. The following sections describe the functions of each of these parameters.

IP Address

For the SNMP management feature to operate with Ethernet or SLIP, the Excalibur DAP 6456/SNMP must be assigned a valid IP address.

Subnet Mask

The Subnet Mask is a bit mask that indicates the bits of an IP address to be interpreted as the subnet address and the bits to be interpreted as the device within the subnet. The Excalibur DAP 6456/SNMP's default Subnet Mask is 255.255.0.0, where 255 defines the subnet and 0 defines the device within the subnet.

Gateway IP Address

The Excalibur DAP 6456/SNMP supports a single Gateway for packet routing. If the packet destination is on the same subnet as the Excalibur DAP 6456/SNMP, the packets are sent directly to the destination. If it is not on the same subnet, the packets have to be routed to the destination through the Gateway. To enable this feature, you must enter a Gateway IP address and a Subnet Mask. The Subnet Mask determines whether the destination is on the same subnet as the Excalibur DAP 6456/SNMP. If it is on a different subnet, the packets are routed through the Gateway. The Excalibur DAP 6456/SNMP's default Gateway IP address is 0.0.0.0. Any valid IP address can be used for the Gateway IP address.

Telnet Configuration Parameters

For security purposes, access from Telnet is protected by a user-configurable log-on sequence consisting of a user identifier and a password. A Telnet session is established only if the log-on entries match the user identifier and password stored in the non-volatile database of the Excalibur DAP 6456/SNMP. The unit only supports one user identifier and one password.

By entering commands from your terminal, you can enter the user identifier and password required for access from Telnet. You can enable or disable the unit from allowing a Telnet session to be established, and you can enable or disable the Login Trap feature. You can also specify the amount of time that the TCP handler will wait for a response to data it has sent before initiating a retry. Additionally, from your terminal, you can view whether a Telnet session is active and you can terminate an active session. The following sections explain the function of each parameter.

Telnet Session

The Telnet Session parameter specifies whether the Excalibur DAP 6456/SNMP will allow a Telnet session to be established. The available options are Enable and Disable.

User Name

When the Excalibur DAP 6456/SNMP is shipped from the factory, the predefined user identifier is **RACAL-DATACOM**. The User parameter allows you to change the user identifier to any alphanumeric name up to 16 characters.

Password

When the Excalibur DAP 6456/SNMP is shipped from the factory, the predefined Telnet user password is **SERVICE**. The Password parameter allows you to change the user password to any alphanumeric name up to 16 characters.

Login Trap

The Login Trap parameter specifies whether an Excalibur DAP 6456/SNMP reports, via a trap to the SNMP manager, that it has established a Telnet session. The available options are **Enable** and **Disable**. When enabled, the Traps parameter in the Manager's Configuration submenu must also be enabled. If this parameter is disabled, the manager does not receive the trap.

TCP Retry Timeout

The TCP Retry Timeout parameter specifies the amount of time, from 0 to 255 seconds, the TCP handler will wait for a response to data it has sent before initiating a retry. The factory default setting is 15 seconds.

Note: It is recommended that you set the TCP Retry Timeout parameter to at least 5 seconds.

Session Status

The Telnet Session Status parameter in the Telnet Status submenu allows you to view whether a Telnet session is currently active. To do so, from the Main menu, type **1** [ENTER]. Then type **4** [ENTER]. The screen displays whether a Telnet session is currently active. To terminate an active session, type **1** [ENTER].

SNMP Configuration Parameters

The SNMP Configuration submenu allows you to perform the following functions for both a primary and secondary SNMP manager:

- Enter the Manager's IP address.
- Enter the GET community names.
- Enter the SET community names.

- Enter the trap community names.
- Enable or disable traps.
- Enable or disable TFTP capability to the primary manager only.

Contact your network administrator to obtain the manager's IP address and the GET, SET, and trap community names.

Enabling Traps

The IP address of the SNMP manager must be entered before you can enable it to receive traps.

Enabling TFTP

The TFTP parameter allows fast downloading or uploading of the Excalibur 6456 DAP/SNMP's configuration and fast downloading of the unit's software from a management station's TFTP server. TFTP provides multiple SET/GET requests of SNMP objects. It can only be enabled with one management station at a time.

During downloading, the application software is protected so that the Excalibur DAP 6456/SNMP continues to operate in the event of a download failure. The unit keeps two copies of the application software. One copy is the original primary firmware version, the other copy is the secondary firmware version used for upgrading. If the secondary firmware version becomes corrupted, the original primary version is used. This feature allows you to start another download if the previous transfer was not completed.

Note: Files for configuration downloading or uploading are denoted by *.cfg. Files for software downloading are denoted by *.ing.

Reset Unit Submenu

The Reset Unit submenu allows you to initiate a soft unit reboot. From the System Configuration menu, type **8** [ENTER]. The screen displays the message: Are you sure you want to reset the unit? (Yes [Y]/No [N]. Type **Y** [ENTER]. (Data is interrupted while the unit is reset and reinitialized.)

System Firmware Menu

The System Firmware menu allows you to download the local Excalibur DAP 6456/SNMP's software from your terminal using Xmodem file transfer protocol over the CTI port. This interface operates in asynchronous mode at 19,200 bps. When the download transfer is complete, the unit automatically reboots to start the new operating firmware. The default baud rate of the CTI port after rebooting is always 19,200 bps.

During downloading, the application software is protected, as previously described in the "Enabling TFTP" section.

To start the download process, from the Main, menu type **3** [ENTER]. The screen displays the parameter:

1. Download Secondary Firmware Using Xmodem.

Type **1** [ENTER]. The screen displays the message: Downloading firmware will reset unit! Continue ? (Yes [Y]/No [N]. Type **Y** [ENTER]. The screen display prompts you to start the download process. When the download transfer is complete, the unit automatically reboots to start the new operating firmware. If you enter the System Firmware menu now, two parameters appear on the screen:

1. Erase Secondary Firmware Version
2. Download Secondary Firmware Using Xmodem

Changing the Console Password

When the Excalibur DAP 6456/SNMP is shipped from the factory, the predefined console password is **SERVICE**. To change the predefined password, from the Main menu, type **5** [ENTER]. The screen display prompts you to enter the current password. Type **SERVICE** [ENTER]. The screen display then prompts you to enter the new password. Type the new password. Then press [ENTER]. The new password is stored in memory.

Logging Off

To end a terminal session at any time, from the Main menu, type **6** [ENTER] at the -> prompt. If the terminal is idle for more than five minutes, a timeout feature disconnects the program and logs off the user.

Chapter 3

Online Operation

Overview

This chapter describes the different procedures that you can perform while the Excalibur DAP 6456/SNMP is operating online. These procedures include monitoring current operating status from five front panel LEDs and monitoring current line status, DTE status, loop status, and line statistics from your terminal.

Front Panel LED Indicators

The five labeled front panel LED indicators allow you to monitor the DAP 6456's operating status at a glance. The two unlabeled LED indicators are reserved for future use. (See Figure 3-1.) Table 3-1 lists each indicator and its respective function.

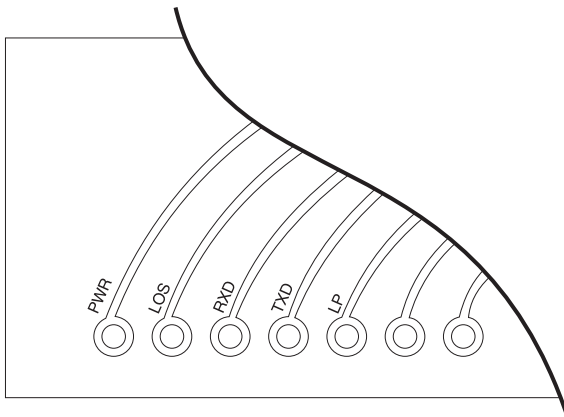


Figure 3-1. Front panel LED Indicators

Table 3-1. Front Panel LED Indicator Functions

Indicator	Color	Function
PWR (Power)	Green	On when power is applied to the unit.
LOS (Loss of Signal)	Orange	On when the receive level is below -45 dB. Flashes when receiving a line fault condition, such as Out of Service (OOS), etc.
RXD (Receive Data)	Yellow	Flashes when transitions in the receive data stream from the DDS line are detected. Off when in an idle state.
TXD (Transmit Data)	Yellow	Flashes when transitions in the transmit data stream from the DTE are detected. Off when in an idle state.
LP (Loop)	Yellow	On when the Excalibur DAP 6456/SNMP is in a loopback condition (local Digital Loopback, remote V.54 Digital Loopback, or a network-initiated loopback).

When you plug in the Excalibur DAP 6456/SNMP, it runs an internal self-test. Any failures cause all the LEDs or the Power LED to flash continuously and stay in this state until you unplug the unit.

Ethernet Connector LED Indicators

The Ethernet controller continuously performs a Link Test. The green LED indicator, located on the rear panel's **10BT** connector, displays the results of this test. (See Figure 3-2.) The indicator is On when the current test indicates the link is operational or when the Link Test is disabled manually from a terminal or Telnet. It is Off when the current test indicates the link is failing.

The yellow LED indicator on the **10BT** connector is On for a short period each time the Ethernet controller transmits a packet.

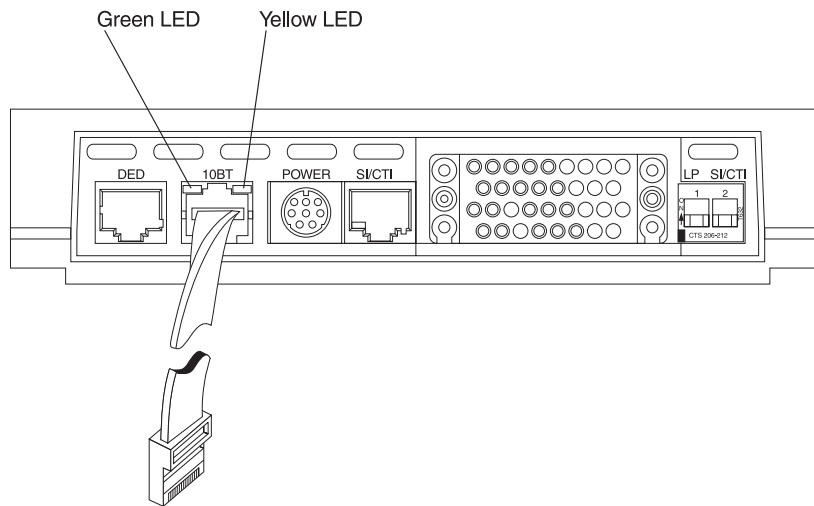


Figure 3-2. Ethernet Connector LED Indicators

Monitoring Operating Status From Your Terminal

The System Status menu allows you to view the current operating status of the dedicated line and the DTE interface signals, and allows you to view whether any tests are in progress. It also allows you to view line statistics for the current hour and for the past 24 hours. The following sections describe each status submenu.

Line Status

From the Main menu, type **1** [ENTER]. Then type **1** [ENTER] again. The screen displays the status of the dedicated line. The parameters and their possible displays are:

<i>Line Rate</i>	-> <i>56K/64K</i>
<i>Receiver</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Receive Signal</i>	-> <i>PRESENT/NOT PRESENT</i>
<i>Unknown Bipolar Violation (56K)</i>	-> <i>PRESENT/NOT PRESENT</i>

<i>OOF Bipolar Violation (56K)</i>	-> <i>PRESENT/NOT PRESENT</i>
<i>OOS Bipolar Violation (56K)</i>	-> <i>PRESENT/NOT PRESENT</i>
<i>Framing (64K)</i>	-> <i>PRESENT/NOT PRESENT</i>

DTE Status

From the Main menu, type **1** [ENTER]. Then type **2** [ENTER]. The screen displays the status of the DTE interface signals. The parameters and their possible displays are:

<i>Request To Send (RTS)</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Data Terminal Ready (DTR)</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Clear To Send (CTS)</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Data Carrier Detect (DCD)</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Data Set Ready (DSR)</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Receive Data DTE (RXD)</i>	-> <i>MARK/SPACE</i>
<i>Transmit Data DTE (TXD)</i>	-> <i>MARK/SPACE</i>
<i>Receive Clock DTE (RXC)</i>	-> <i>PRESENT/NOT PRESENT</i>
<i>Transmit Clock DTE (TXC)</i>	-> <i>PRESENT/NOT PRESENT</i>

Loop Status

From the Main menu, type **1** [ENTER]. Then type **3** [ENTER]. The screen displays whether any tests are in progress. (The tests are described in Chapter 4.) The parameters and their possible displays are:

<i>Non-Latching Loop</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Latch Loop</i>	-> <i>ACTIVE/INACTIVE</i>
<i>V54 Loop</i>	-> <i>ACTIVE/INACTIVE</i>
<i>CSU Loop</i>	-> <i>ACTIVE/INACTIVE</i>
<i>Bi-directional Loop</i>	-> <i>ACTIVE/INACTIVE</i>

Statistics

The Statistics feature allows you to measure and display the quality of a transmission line from a SNMP manager's console, Telnet, or your terminal. This feature provides information that allows you to measure the amount of time your network is available for use, and allows you to identify specific digital line problems. The Excalibur DAP 6456/SNMP can store up to 24 hours of statistics. The statistics displays are updated continuously in 1-second increments. Table 3-2 lists each line statistic.

Table 3-2. Line Statistics

Statistic	Cause
Receive Line Fault	Invalid receive line conditions are occurring.
Receive Level	The receive level is below -45 db.
Out of Service	Out of Service codes are being received from the network when the Excalibur DAP 6456/SNMP is operating at 56 Kbps.
Out of Frame	Loss of frame conditions are occurring when the Excalibur DAP 6456/SNMP is operating at 64 Kbps.
Unknown Codes	Unknown control codes are being received from the network.
Service Loop	A network-initiated service loop is occurring.
Network Down	Total time the network has been unavailable due to all the line conditions.
Signal Down	Total time the network has been unavailable due to all the line conditions, excluding service loops.

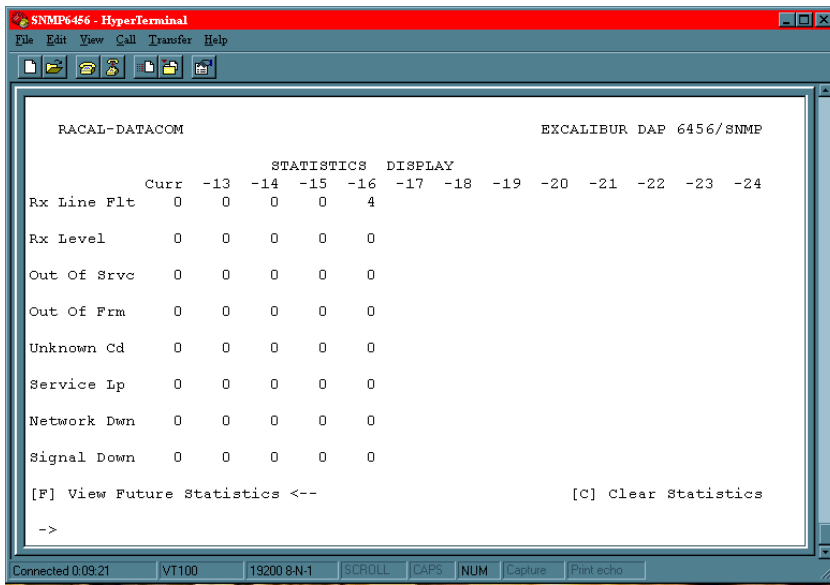
To view the statistics, from the Main menu, type **1** [ENTER]. Then type **5** [ENTER]. The following display appears on the screen. The display shows the line statistics for the current hour and for the past 12 hours. The number of seconds the condition occurred is displayed under each hour.

	Curr	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
Rx Line Flt	0	0	0	0	0	0	0	0	0	0	0	0	0
Rx Level	0	0	0	0	0	0	0	0	0	0	0	0	0
Out Of Srvc	0	0	0	0	0	0	0	0	0	0	0	0	0
Out Of Frm	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown Cd	0	0	0	0	0	0	0	0	0	0	0	0	0
Service Ip	0	0	0	0	0	0	0	0	0	0	0	0	0
Network Dwn	0	0	0	0	0	0	0	0	0	0	0	0	0
Signal Down	0	0	0	0	0	0	0	0	0	0	0	0	0

[C] Clear Statistics --> [P] View Past Statistics

->

Type **P** [ENTER]. The following display appears on the screen. The display shows the line statistics for the current hour and for the past 13 through 24 hours. This display shows receive line faults occurred for 4 seconds 16 hours ago.



To return to the previous display, Type **F** [ENTER]. To cancel the current line statistics and reset them to zero, type **C** [ENTER] from either statistics display screen.

System Information

To enter the System Information menu, from the Main menu, type **4** [ENTER]. The screen displays the following information about your Excalibur DAP 6456/SNMP:

Mac Address
Part Number
Serial Number
Primary Firmware Revision
Secondary Firmware Revision
Analog Front End Firmware Revision

Chapter 4

Troubleshooting

Overview

Diagnostic tests allow you to quickly isolate the source of network malfunctions. The Excalibur DAP 6456/SNMP provides local digital loopback and remote V.54 digital loopback tests. Additionally, the DAP 6456/SNMP supports CSU loopback, latching loopback, and non-latching loopback tests initiated by the network. This chapter describes each of these tests.

Digital Loop Test

The Digital Loop test isolates the local DTE from the rest of the network. During this test, the DAP 6456/SNMP establishes two loops. It loops its receiver output to its transmitter input, and its transmit data input from the DTE to its receive data output to the DTE. (See Figure 4-1.)

To activate this test, set DIP switch **LP** in the Up position. To terminate the test, set it in the Down position. This test will not be activated, regardless of the DIP switch setting, when the **LP** LED is On. The **LP** LED On condition indicates a remote V.54 Digital Loop test or a network-initiated loop test is active.

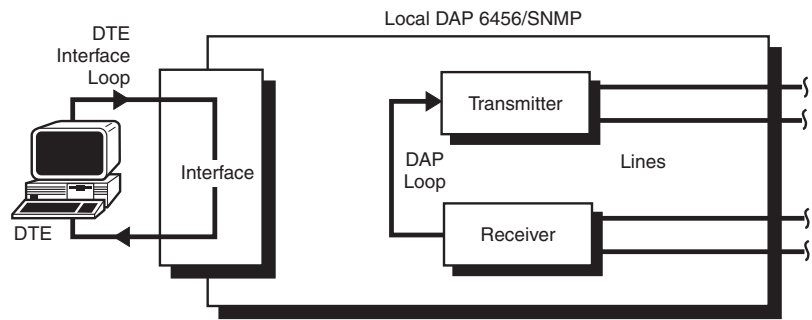


Figure 4-1. Digital Loop Test

V.54 Digital Loop

The V.54 Digital Loop test differs from the standard Digital Loop test in that it creates only one loop. It loops its receiver output to its transmitter input. It electronically disconnects the DAP 6456/SNMP from the DTE at the remote unit. The local unit functions normally. (See Figure 4-2.)

This test is controlled by the state of the RL pin on the V.35 interface connector. An On condition sends the remote DAP 6456/SNMP into a V.54 Digital Loop test.

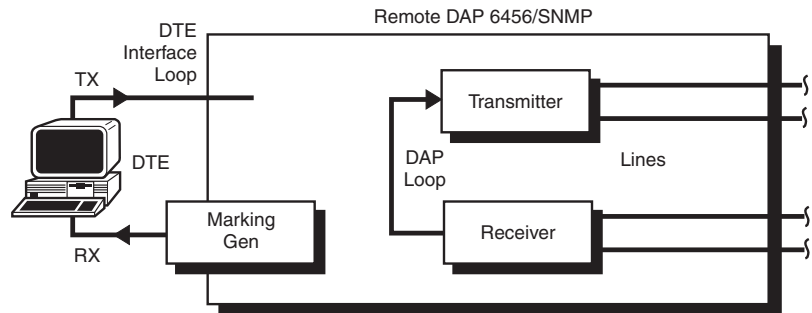


Figure 4-2. V.54 Digital Loop Test

Service Loops

Service loops are part of the DDS network's diagnostic capabilities. They are used to isolate trouble conditions in the local serving loop and the customer's data communications equipment. The service loops provided by the Excalibur DAP 6456/SNMP are described in the following sections. Refer to AT&T Publication 62310 for more complete information.

CSU Loopback Test

The CSU Loopback test is a mandatory network loopback test enabled by a reversal of the local cable simplex polarity. The DDS line receive data is looped to DDS line transmit data. At the DTE interfaces, DCD is off and receive data is clamped to a Mark. (See Figure 4-3.)

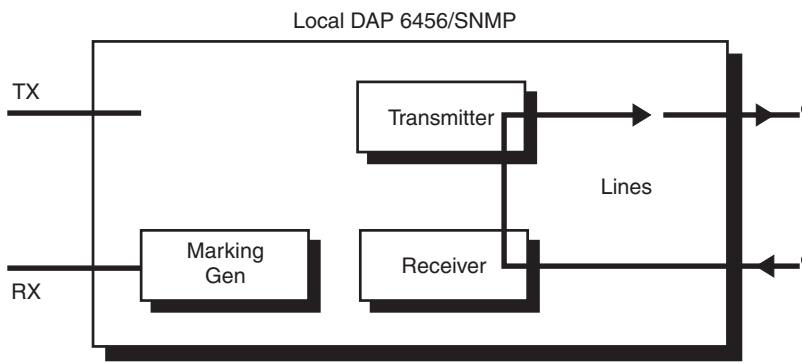


Figure 4-3. CSU Loopback Test

Non-Latching Loopback Test

The Non-Latching Loopback test is an optional network loopback test. This test is enabled by the reception of a minimum of four specific loopback codes. It is maintained as long as every other byte contains a loopback code, until five successive bytes are received without the loopback indication. This test is operational in 56 Kbps DDS mode. DDS line receive data is looped to DDS line transmit data. At the DTE interfaces, DSR and CTS are off, and receive data is clamped to a Mark. (See Figure 4-4.) CSU, DSU, and OCU loopbacks are supported.

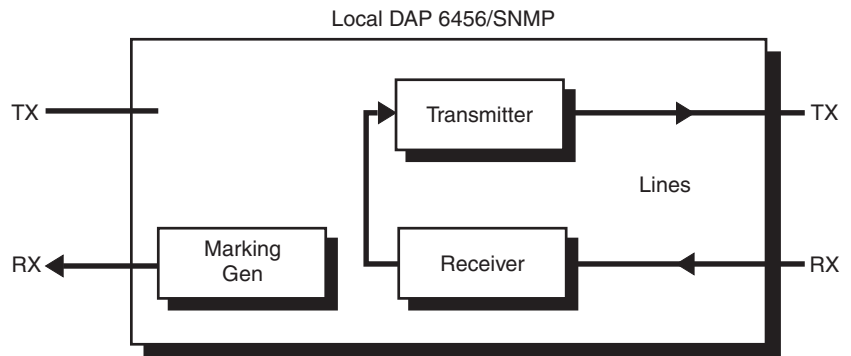


Figure 4-4. Latching and Non-Latching Loopback Tests

Latching Loopback Test

The Latching Loopback test is an optional network loopback test initiated by the reception of a complex sequence of code bytes as defined by AT&T Publication 62310. It is operational in Clear Channel 64 Kbps mode. This loopback test uses the same signal routing as called for by the Non-Latching Loopback test, except that the mapping of some return bytes is different. Refer to AT&T Publication 62310 for this mapping. (See Figure 4-4.)

Appendix A

Technical Specifications

Physical Specifications

Height	1.32" (3.35 cm)
Width	6.89" (17.50 cm)
Depth	9.84" (24.99 cm)
Weight	1 9 lb. (0.8 kg)

Line Requirements

Operates on 56 Kbps Basic DDS and Clear Channel 64 Kbps services

Network Configurations

Basic DDS service: point-to-point and multipoint

Clear Channel 64 Kbps Service: point-to-point

PPP/SLIP/Terminal Interface

10-position jack, synchronous or asynchronous PPP/asynchronous SLIP interface at rates of 2.4, 4.8, 9.6, and 19.2 Kbps. Can also be used as a VT100-compatible terminal interface

Ethernet Interface

10-position modular jack (RJ45), Ethernet (10Base-T) port interface

DTE Speeds

Synchronous: 56 and 64 Kbps

DTE Interface

CCITT V.35

Channel Interface

8-position keyed modular jack

Receiver Sensitivity

0 to 45 dB loop loss

Carrier Mode	Constant, switched	
Clocking	Slave, external	
Tests	Self, local digital loopback, remote V.54 digital loopback	
Network Diagnostics	CSU loopback, latching loopback, non-latching loopback	
LED Indicators	Power, loss of signal (LOS), receive data, transmit data, loop	
DIP Switches	Two — one to enable either the VT100-compatible terminal interface or the PPP/SLIP interface; and the other to initiate or terminate a local digital loop test	
Environmental	Ambient Temperature	32°F to 122°F (0°C to 50°C)
	Relative Humidity	10% to 95% ($\pm$ 5%) noncondensing
	Storage Temperature	-40°F to 158°F (-40°C to 70°C)
Power Supply	External, 100-250 VAC, 50-60 Hz, 0.3 A input current	

Appendix B

Regulatory Information

FCC Part 15: Radio/Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications to this equipment not expressly approved by Racal-Datcom can void the user's authority to operate this equipment.

Special Notice

The instructions in this manual involving actions with the device and requiring a tool* for access, must be performed only by qualified service personnel.

- * A tool is defined as any implement used to facilitate a mechanical operation, such as operating a fastener or similar fixing device.

Chaque fois que le manuel d'instructions recommande d'utiliser un outil* pour effectuer une opération à l'intérieur du dispositif, cette opération doit absolument être confiée à un personnel de service qualifié.

- * Un outil est défini tout dispositif utilisé pour faciliter une opération mécanique, p.ex., le fonctionnement d'un organe de fixation ou autre dispositif semblable.

Notice to Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le règlement sur le brouillage Radioélectrique édicté par le Industrie Canada.

Power Requirements

For use with a CSA certified/UL listed power supply, with NEC Class 2 output(s): rated output +5 VDC, 1.4 A, +12 VDC, 0.4 A, -12 VDC, 0.15 A.

Pour utiliser avec une alimentation CSA certifiée dotée de sortie de Classe 2 avec caractéristiques nominales de sortie +5 VDC, 1.4 A, +12 VDC, 0.4 A, -12 VDC, 0.15 A.

FCC Part 68: Requirements For End Users

This equipment complies with Part 68 of the FCC regulations. On the bottom of the unit is an equipment label that contains, among other information, the FCC registration number (AP3USA-31563-DE-N) and Ringer Equivalence Number (REN), which is N.A. for this unit. If requested, provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most but not all areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, call your local telephone company to determine the maximum REN for your calling area.

An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

The following are the associated private line port, jack, Facility Interface Code (FIC), and Service Order Code (SOC) for this device:

<u>Port</u>	<u>Jack</u>	<u>FIC</u>	<u>SOC</u>
56 Kbps	RJ48S	04DU5-56	6.0F

Note that some types of analog private line connections may require the filing of a signal power affidavit with the telephone company, and some types of digital installations may require the filing of an "Encoded Analog Content and Billing Protection" affidavit.

This unit cannot be used on the public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission or corporation for further information.)

If the unit causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, you will be notified in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

All repairs on your unit must be performed by the Racal Data Group company that manufactured the unit or by an authorized representative of that company. For service information, contact the appropriate Customer Support Office nearest you. Contact information is listed in the front of this manual.

Industry Canada: Requirements for End Users

Notice: Industry Canada identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe systems, if present, are connected together. This precaution may be particularly important in rural areas.



Warning: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 4 per port.

Repairs: Inquiries regarding Canadian repair centers should be addressed to the Racal-Datacom company that manufactured your unit. For Canadian service information, contact the appropriate Customer Support Office nearest you. The office(s) are listed on page v in the front of this manual.

Appendix C

Connector Pin and Signal Assignments

Introduction

The tables in this appendix list the pin and signal assignments for the following:

- V.35 DTE connector
- Dedicated line connector
- PPP/SLIP/terminal connector
- Ethernet 10Base-T connector

Table C-1. V.35 DTE Connector, Pin/Signal Assignments

Pin	CCITT V.35 Symbol	Mnemonic	Input/ Output	Function
B	102	–	–	Signal ground
C	105	RTS	Input	Request-to-Send
D	106	CTS	Output	Clear-to-Send
E	107	DSR	Output	Data Set Ready
F	109	RLSD (DCD)	Output	Received Line Signal Detector
H	108	DTR	Input	Data Terminal Ready
J	125	RI	–	Not connected

Table C-1. V.35 DTE Connector, Pin/Signal Assignments (Continued)

Pin	CCITT V.35 Symbol	Mnemonic	Input/ Output	Function
L	141	LL	Input	Not used
N	104	RL	Input	Remote Digital Loop Command
P	103	TXD (A)	Input	Transmit Data
S	103	TXD (B)	Input	Transmit Data
R	104	RXD (A)	Output	Receive Data
T	104	RXD (B)	Output	Receive Data
U	113	ExTxC (A)	Input	External Transmit Clock
W	113	ExTxC (B)	Input	External Transmit Clock
V	115	RxC (A)	Output	Receiver Signal Element Timing
X	115	RxC (B)	Output	Receiver Signal Element Timing
Y	114	TxC (A)	Output	Transmitter Signal Element Timing
AA	114	TxC (B)	Output	Transmitter Signal Element Timing
NN	142	TM	Output	Test Mode

Table C-2. Dedicated Line Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Transmit Ring (R)	Output	Connection to the telephone line, transmit side
2	Transmit Tip (T)	Output	Connection to the telephone line, transmit side
3	No Connection	—	—
4	No Connection	—	—
5	No Connection	—	—
6	No Connection	—	—
7	Receive Tip (T1)	Input	Connection to the telephone line, receive side
8	Receive Ring (R1)	Input	Connection to the telephone line, receive side

Table C-3. PPP/SLIP/Terminal Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	—	—
2	Clock	Output	EIA-232-E level
3	Not Used	—	—
4	Ground	—	Signal ground
5	Transmit Data	Output	EIA-232-E level data

Table C-3. PPP/SLIP/Terminal Connector, Pin/Signal Assignments
(Continued)

Pin No.	Signal	Input/ Output	Function
6	Receive Data	Input	EIA-232-E level data
7	Not Used	—	—
8	Not Used	—	—
9	Not Used	—	—
10	Not Used	—	—

Table C-4. Ethernet 10Base-T Connector, Pin/Signal Assignments

Pin No.	Symbol	Function
1	TD+	Transmit Data Positive
2	TD-	Transmit Data Negative
3	RD+	Receive Data Positive
4	—	—
5	—	—
6	RD-	Receive Data Negative
7	—	—
8	—	—

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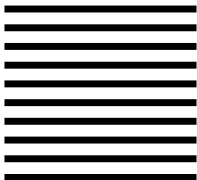
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